

PROGRESSIVE RATIO APPLICATION

MED-STATE NOTATION™ PROCEDURE

SOF-700RA-2 Manual
DOC-022
Rev. 1.2

Copyright © 2008
All Rights Reserved

MED Associates Inc.
P.O. Box 319
St. Albans, Vermont 05478
www.med-associates.com

Trademarks: MedState Notation™, MED Associates, Inc.
Registered Trademark:
MED-PC®, MED Associates, Inc.
Delphi®, Borland International, Inc.

TABLE OF CONTENTS

Chapter 1	1
Getting Started	1
Introduction	1
Overview of the Procedure	2
Chapter 2	3
Getting Started	3
Software Installation	3
Backing Up the Software	3
Chapter 3	4
Beginning & Running an Experiment	4
Translating The MED-PC IV (.mpc) File	4
Using the MED-PC IV Load Wizard	5
Viewing/Changing Variable Values	10
Macros	12
Modifying the MedState Notation Code	13
Chapter 4	14
Understanding the Data Files	14
Sample Data File	14
Breakdown of Sample File - Simple Variables:	15
Breakdown of Sample File - Arrays	16
Array A - Raw Data	16
Array A with Labels	16
Array B - Raw Data	17
Array C – SoftCR Pro Data	17
Array C with Labels	17
Array X – array with assigned values.....	18
Chapter 5	19
SoftCR Pro	19
Time Components	19
Control Code Components	19
Data Element Format	19
Example of SoftCR Pro	21

CHAPTER 1

Getting Started

Introduction

The purpose of this manual is to give an explanation of the MED State Notation™ Procedures that comprise the SOF-700RA-2 Progressive Ratio Procedures. The files in this package can be found on the disk provided by MED Associates, Inc.

These procedures are intended to be run in MED Associates MED-PC® IV software. The latest version of MED-PC® IV gives researchers the ability to use pre-programmed procedures such as these to make hardware control and data collection easy. These pre-programmed procedures can also be modified to meet the evolving demands of a research protocol. Again, it is the intent of this manual to explain exactly what these procedures implement, and provide guidance into how to interpret what the program code achieves in order to let the user determine how to modify them to match their research protocol demands. The manual provides some examples of editing and modifying the procedure's programming code. The manual also defines the elements in the raw data file produced by these procedures.

In addition to this manual, refer to the **MED-PC® IV User's Manual** for the installation of the MED-Associates interface drivers, the MED-PC IV Software, and the Delphi® Compiler. Also refer to the User's Manual for instructions on developing a Hardware Configuration. Data file structure, file-saving format, and other related options are also determined by the Hardware Configuration. Running the Hardware Configuration software utility that accompanies MED-PC IV sets the Hardware Configuration. Its purpose is to assign the inputs and outputs on the interface cards in the interface cabinet for each task controlled by MED-PC IV. The particular type of interface card that is supplied in the interface cabinet may vary; please refer to the User's Manual provided for instructions on how to configure the type of card that is in the cabinet. A valid Hardware Configuration must exist in order for MED-PC IV to interface correctly with the MED Associates, Inc. hardware. This means that one should take the time to create a valid Hardware Configuration before attempting to run the procedures included in this package.

Should there be any problems, the staff at MED Associates, Inc. is available to answer any questions that may arise. Please e-mail us at support@med-associates.com with a detailed description of the problem or desired goals so that concise and detailed information may be provided.

The Progressive Ratio procedures are designed to be as easy to use as possible. MED Associates, Inc. understands that researchers do not have the time to devote to programming and hardware design, and for that reason, we have undertaken that burden for you. We sincerely hope that you are satisfied with the products and services we provide, and look forward to meeting your future experimental needs as your research program evolves.

Overview of the Procedure

The test animal is required to respond on the specified lever on a progressively increasing ratio schedule. The ratio may be set to increase after each reward or after multiple rewards. The subject is rewarded when the ratio is met. A time out following the reward may be implemented. The session ends based on time. Correct and incorrect lever presses are counted and the percent correct and incorrect are calculated at the end of the session.

The correct lever should be set to '1' for left or '2' for right. The default is set to left lever.

The reward should be set to '1' for a pellet, '2' for a dipper presentation, or '3' for a drug infusion. The default is set to pellet.

The reward time specifies how long, in seconds, to activate the reward. Pellet dispensers only need a 0.05 second pulse to activate. A dipper presentation or drug infusion may be set to longer times as required.

If desired, a time out (in seconds) following the reward may be implemented. If it is not wanted, set the time to zero seconds. Lever presses made during the time out are not counted.

The default session time is 60 minutes. This value is set in minutes.

The type of progressive ratio (PR) may be specified as Step or List. If the progressive ratio is a Step type, the Starting PR Value and Step Value must be specified too. The ratio starts with the Start PR Value and is incremented by the Step Value each time the PR Frequency is met. The List progressive ratio pulls the ratio values from the "X" list. The list may be modified to any sequence desired (see **Modifying the MedState Notation™ Code**).

The progressive ratio may be set to increase after each reward or after multiple rewards. The default PR Frequency is set to one, which increases the ratio after each reward.

By default, the lever presses and rewards are recorded in the C-array for later viewing in Med Associates' Soft Cumulative Recorder (SoftCR Pro). Correct lever presses are recorded as steps, rewards as pips, and incorrect lever presses as event zero pens.

CHAPTER 2

Getting Started

Software Installation

Please refer to the **MED-PC IV User's Manual** for a complete guide to installing the MED-PC IV software, building a valid Hardware configuration with the Hardware Configuration utility, and opening and compiling a MSN procedure in the Trans-IV utility.

To install the Progressive Ratio Procedure, insert the CD into the CD-ROM drive and click **Install the Progressive Ratio Software**. The Progressive Ratio procedure is copied into the C:\MED-PC IV\MPC folder.

Backing Up the Software

Med Associates strongly encourages creating backup copies of the programs in case of disk failure. Having copies of the original programs may be useful in the future should modifications be made to the existing programs.

CHAPTER 3

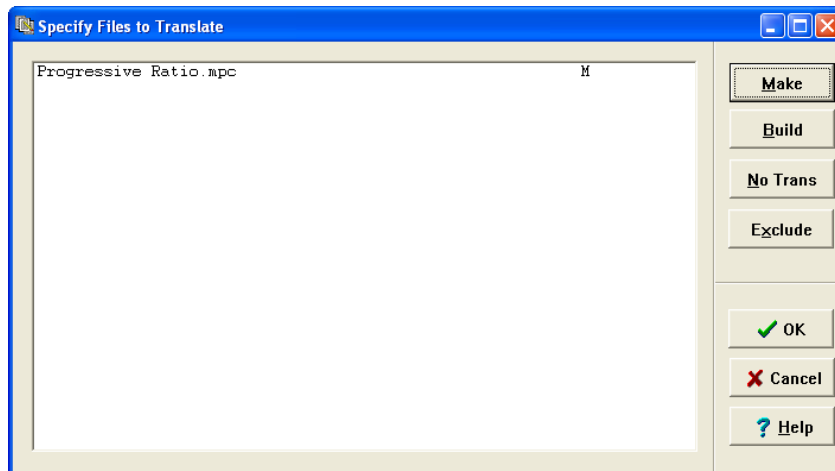
Beginning & Running an Experiment

Translating The MED-PC IV (.mpc) File

Programs written in MedState Notation must be translated using Trans IV before they can be executed in this application. Be sure that a copy of the file being translated is present in the directory "C:\MED-PC IV\MPC\." Open Trans IV icon and select **Translation | Translate and Compile**.

Select the program(s) to use for the experiment and click **M**ake. Click **OK** to start the translator, and it will automatically parse the MedState Notation and then open to a DOS screen to compile the Pascal code. Depending on the speed of the computer, each of these steps may not be seen. If any problems are encountered during this process, refer to the on-screen help menu or the **MED-PC Version IV User's Manual**, or contact MED Associates, Inc. for assistance.

Figure 3.1 - Trans IV Control Panel for Translating and Compiling MedState Notation Code



Using the MED-PC IV Load Wizard

MED-PC IV is designed to help the researcher run an experiment by guiding selection choices through its Experiment Loading Wizard. This section will describe how to initiate the Progressive Ratio.mpc application, however the following steps that will also apply to all other .mpc procedures.

Open MED-PC IV and the MED-PC Experiment Loading Wizard's Welcome screen, shown in Figure 3.2 will appear.

Figure 3.2 - The MED-PC IV Loading Wizard Welcome Screen



To avoid this load wizard, deselect the checkbox labeled **Run this experiment automatically when starting MED-PC**. Close this screen by clicking the **Close** button. Closing this screen immediately reveals the MED-PC Run-Time Screen shown in Figure 3.9. If the choice to continue with the Loading Wizard is made, then click the **Next** button.

The Box Selection screen will appear next, as shown in Figure 3.3. From this screen the researcher chooses which boxes will be used in the experiment. Select the boxes that will run the experiment by clicking in the radio button next to the box number. The figure shows that the Hardware Configuration included only 1 box, which was selected. Click **Next** to continue.

Figure 3.3 - The Box Selection Screen



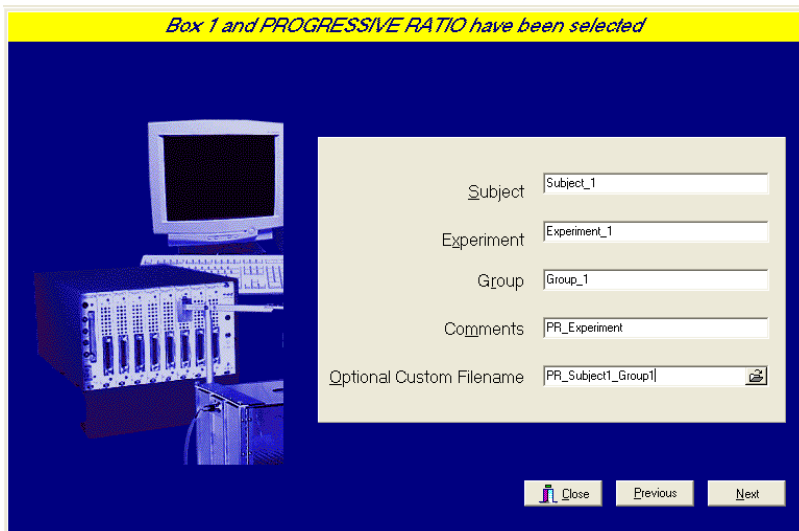
The Select a Procedure screen appears next, as seen in Figure 3.4. This is where the application to be run is selected. The screen displays a list of all the currently compiled procedures. Select the desired procedure and then click **Next**.

Figure 3.4 - The Select a Procedure Screen



The Enter Experiment Data Screen should display next, as shown in Figure 3.5. The purpose of this screen is to allow annotations to be added to the data file that is produced by MED-PC IV. These annotations will help identify the Subject, Experiment, and Experiment Group upon which data was collected. Comments can be added here as well, and the data file can be given a customized file name to help identify it from other data files. Enter the information desired, and click **Next**.

Figure 3.5 - Enter Experiment Data Screen




Box 1 and PROGRESSIVE RATIO have been selected




Subject:

Experiment:

Group:

Comments:

Optional Custom Filename: 

The next screen to appear is the Review Choices screen, as seen in Figure 3.6. This is a method of confirming that the information received from the Box/Procedure Selected is correct. If it is not correct, select **Previous**, and edit the data. If it is correct, select **Next**.

Figure 3.6 - Review Choices Screen



Review Choices

Review the data below.

Box: 1
Procedure: PROGRESSIVE RATIO
Subject: Subject_1
Experiment: Experiment_1
Group: Group_1
Comment: PR_Experiment
Filename: PR_Subject1_Group1

**Click "Next" to finish loading the box
or "Previous" to correct errors.**

The Alter Session Parameters Screen, shown in Figure 3.7, is the next screen to appear, and is an important screen for the researcher. The Alter Session Parameters screen allows the researcher to alter the parameters by which a procedure executes. The Send Start Command Screen appears next. The options available on the screen vary depending upon how many boxes are described in the Hardware Configuration.

Figure 3.7 - Alter Session Parameters Screen

Box 1 and PROGRESSIVE RATIO have been selected

Alter session parameters — if necessary

Correct Lever (Left=1 Right=2)	1.000
Reward (Pellet=1 Dipper=2 Drug=3)	1.000
Reward Time (sec)	0.050
Time Out Following Reward (sec)	0.000
Session Length (min)	60.000
Type of PR (Step=1 List=2)	1.000
Starting PR (Type 1 Only)	1.000
Step Value (Type 1 Only)	1.000
Step Frequency	1.000
SoftCR Data Array (Yes=1 No=0)	1.000

Close Next

In this example only 1 box is described in the Hardware Configuration, so Figure 3.8 will appear next. If more than 1 box is in the Hardware Configuration, then Figure 3.9 will appear.

Figure 3.8 - Send Start Command Screen for Single Box Configuration

Load More Boxes or Send Start Command?

☒ I want to send start signals to already loaded boxes

☐ I am finished with the wizard

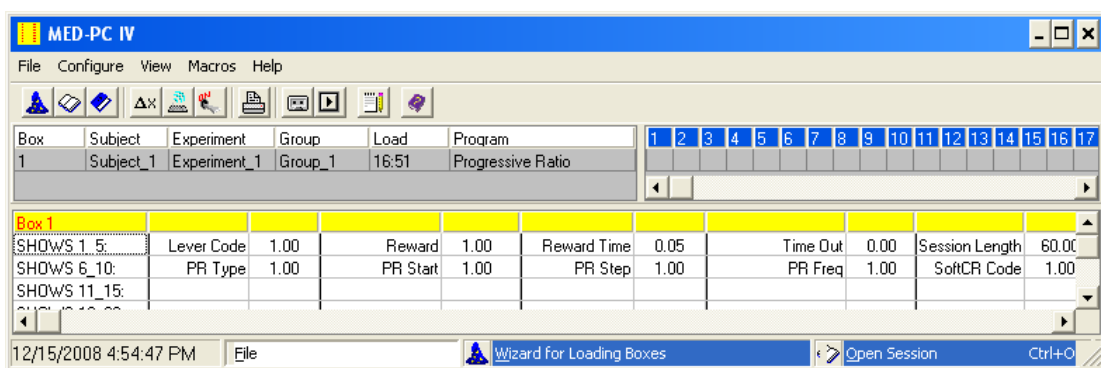
Close Continue

Figure 3.9 - Send Start Command Screen for Multiple Box Configuration



In both cases (Figure 3.8 and Figure 3.9), the screens are where the researcher decides to either load more boxes, send a start signal to boxes that are already loaded, or enter the MED-PC IV run-time environment without sending a start signal by selecting "I am finished with the wizard". This option results in the screen shown in Figure 3.10.

Figure 3.10 - The MED-PC IV Run-Time Screen



Viewing/Changing Variable Values

Before a “start command” has been issued, any variable may be changed on the MED-PC IV run-time screen. Simply highlight the value to change, and then enter the new value. Once a session is in progress, change variables by selecting **Configure | Change Variables**, or click the 4th tool bar item **ΔX**. In the lower left hand corner of the Change Variables window, find the “Display Data from Box” display, and choose the chamber(s) to modify. By clicking additional boxes in the “Additional Boxes to Update” section, changes made to a single box are automatically loaded to all of the selected boxes.

Figure 3.11 - Changing Variables Screen

A Array	B Array	C Array	D: 0.000	E: 0.000
F: 0.000	G: 0.000	H: 0.000	I: 0.000	J: 0.000
K: 0.000	L: 0.000	M: 0.000	N: 0.000	O: 0.000
P: 0.000	Q: 0.000	R: 0.000	S: 0.000	T: 0.000
U: 0.000	V: 0.000	W: 0.000	X Array	Y: 0.000
Z: 0.000				

Named Vars

Vars

Refresh

Issue

Close

Help

Display Data from Box

Additional Boxes to Update

☐ 1

Select All Deselect All

D from Box 1

0.000

The value of any simple variable may be viewed from this screen by clicking an array on the table and each element in that array can be viewed, as shown in Figure 3.12. To change a value, simply highlight and replace the value in the lower right hand box or use the up/down arrows to increment by 1. Click the **Issue** button for the change to take effect. Click **Named Variables** to produce the display in Figure 3.13. Change variables here as needed.

Figure 3.12 - Displaying Array A from Box 1

Displaying Array A from Box 1

A(0) 1.000	A(1) 1.000	A(2) 0.050	A(3) 0.000	A(4) 60.000
A(5) 1.000	A(6) 1.000	A(7) 1.000	A(8) 1.000	A(9) 1.000

Named Vars
Vars
Refresh
Issue
Close
Help

Display Data from Box
1

Additional Boxes to Update
☐ 1
Select All Deselect All

A(0) from Box 1
1.000

Figure 3.13 - Displaying Named Variables from Box 1

Displaying Named Variables from Box 1

Correct Lever (Left=1 Right=2)	1.000
Reward (Pellet=1 Dipper=2 Drug=3)	1.000
Reward Time (sec)	0.050
Time Out Following Reward (sec)	0.000
Session Length (min)	60.000
Type of PR (Step=1 List=2)	1.000
Starting PR (Type 1 Only)	1.000
Step Value (Type 1 Only)	1.000
Step Frequency	1.000

Named Vars
Vars
Refresh
Issue
Close
Help

Display Data from Box
1

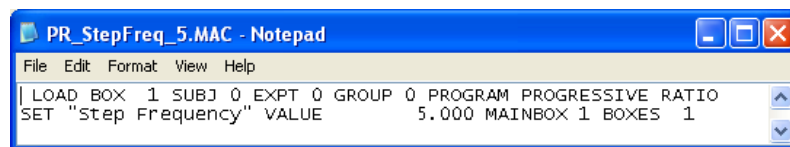
Additional Boxes to Update
☐ 1
Select All Deselect All

Macros

The simplest way to initially create a macro is to record keyboard functions while performing the steps manually. Once the commands are in the macro, it is easy to create a number of macros with the macro editor. The following example illustrates the process of loading "Box 1" and changing the Step Frequency to 5.

To begin, open MED-PC IV and going directly to the run time screen. Close the load wizard, if present. Before loading or opening the procedure, click **Macro** on the main menu and select **Turn On Macro Recorder** or click the 8th tool bar item with the cassette tape icon on top. A note on the bottom of the display indicates that the recorder is running. Open "Progressive Ratio.mpc" by clicking **Files | Open Session**. Change the variables using any of the methods described above. When all settings have been made, turn the recorder off again by using the main menu or tool bar. Save the macro with a distinctive name. The example in Figure 3.14 was named "PR_StepFreq_25.mac" since the Step Frequency was changed to 5.

Figure 3.14 – PR-StepFreq_5.mac

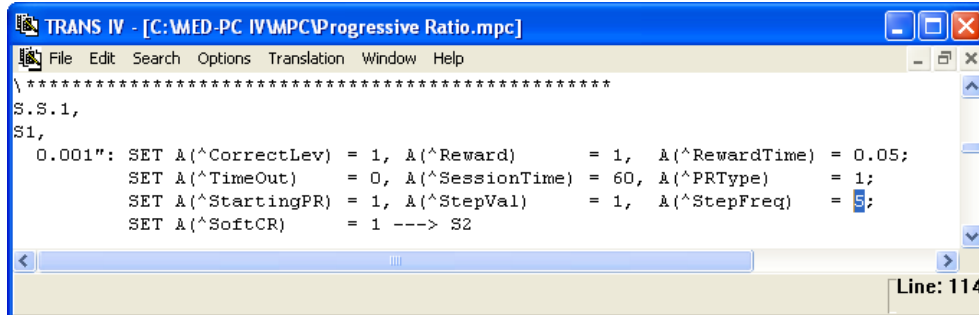


Once this macro is built, use the macro editor to make simple changes such as replacing reward or correct lever values. Review the Help file on screen or the **MED-PC IV User's Manual** for more information on macros and the features offered. A START command or message box followed by a START command could be added to the macro (it was left off here so changes could be verified before starting the procedure).

Modifying the MedState Notation Code

Permanent changes to the Progressive Ratio procedure can be made to the MedState Notation code. To make the same change to the Step Frequency as shown above, do the following. Open Trans IV and select **File | Open** to place Progressive Ratio.mpc into the text editor. Scroll down to approximately line 114 (note the line counter in the lower right hand corner of the editor) to reveal the code shown in Figure 3.15.

Figure 3.15 – Progressive Ratio.mpc Lines 114



```
TRANS IV - [C:\MED-PC IV\WPC\Progressive Ratio.mpc]
File Edit Search Options Translation Window Help
\ *****
S.S.1,
S1,
0.001": SET A(^CorrectLev) = 1, A(^Reward) = 1, A(^RewardTime) = 0.05;
        SET A(^TimeOut) = 0, A(^SessionTime) = 60, A(^PRTType) = 1;
        SET A(^StartingPR) = 1, A(^StepVal) = 1, A(^StepFreq) = 5;
        SET A(^SoftCR) = 1 ---> S2
Line: 114
```

Change $A(^{\text{StepFreq}}) = 1$ to $A(^{\text{StepFreq}}) = 5$ and save the changes with the same or a new file name such as PR_StepFreq_5.mpc. Remember, if creating a new .mpc file name and are using a macro to load boxes, the file name in the macro also must be changed. Translate and compile the new or changed file as described previously and run MED-PC IV. Use the "Change Variables" screen to view/confirm the new values.

CHAPTER 4

Understanding the Data Files

Unless otherwise specified, data will be saved to C:\MED-PC IV\DATA. Data can be saved manually by selecting **FILE | SAVE DATA MANUALLY** or **FILE | SAVE DATA (FLUSH)**. The file name that is used to save the data in depends on the option that was chosen in the Hardware Configuration Utility and may also be dependent on the Subject, Experiment, and Group name provided in the MED-PC IV load wizard. Within each data file, the headings are created for each Subject, Experiment, Group, Box, etc., (see below). Data files may be opened with note pad, word pad, or any word processor or spreadsheet; however, be sure they are always saved "unformatted" in case a data extraction utility such as MED-PC to Excel might ever be used. Data file formats are explained in detail in the **MED-PC IV User's Manual**.

Sample Data File

Select **Annotated** on the file options page during hardware installation to produce a raw data file similar to the following. Data files are located in C:\MED-PC IV\Data\ unless an alternate path was defined during hardware installation. They may be opened with note pad, word pad, or any word processor; however, make sure they are always saved unformatted in the occasion a data extraction utility such as MPC2XL is used. The header information should be self-explanatory. Data-file formats are explained in detail in the **MED-PC IV User's Manual**.

File: C:\MED-PC IV\DATA\!2004-03-10

```
Start Date: 03/10/04
End Date: 03/10/04
Subject: 1
Experiment: 1
Group: 1
Box: 1
Start Time: 10:16:13
End Time: 10:19:11
MSN: Progressive Ratio
D:      0.375
E:      0.625
F:      2.000
G:      0.000
H:      0.000
I:     16.000
J:      0.000
K:      0.000
L:      0.000
M:      0.000
N:      0.000
O:      0.000
P:      0.000
Q:      0.000
R:      0.000
S:     173.000
T:    1055.000
U:      0.000
V:      0.000
W:      0.000
Y:      0.000
Z:      0.000
```

A:	0:	1.000	1.000	5.000	0.000	60.000
	5:	1.000	3.000	1.000	1.000	1.000
B:	0:	8.000	3.000	5.000		
C:	0:	0.500	85.600	0.500	12.600	0.500
	5:	77.600	0.500	18.600	0.500	53.600
	10:	0.500	161.100	0.200	140.100	135.100
	15:	0.200				
X:	0:	1.000	2.000	3.000	4.000	5.000
	5:	6.000	7.000	8.000	10.000	12.000
	10:	14.000	16.000	18.000	20.000	22.000
	15:	24.000	28.000	32.000	36.000	40.000
	20:	44.000	48.000	52.000	56.000	64.000
	25:	72.000	80.000	88.000	96.000	104.000
	30:	112.000	120.000	128.000	136.000	144.000
	35:	152.000	160.000	168.000	176.000	184.000
	40:	192.000	200.000	208.000	216.000	224.000
	45:	232.000	240.000	248.000	256.000	264.000
	50:	272.000	280.000	288.000	296.000	304.000
	55:	312.000	320.000	328.000	336.000	344.000
	60:	352.000	360.000	368.000	376.000	384.000
	65:	392.000	400.000	408.000	416.000	424.000
	70:	432.000	440.000	448.000	456.000	464.000

Breakdown of Sample File - Simple Variables:

The following simple variables are shown immediately following the header information:

D:	0.375	D x 100 = Percent Correct Responses
E:	0.625	E x 100 = Percent Incorrect Responses
F:	2.000	Total Rewards
G:	0.000	Not Used
H:	0.000	Not Used
I:	16.000	Subscript for the IRT Array C
J:	0.000	Not Used
K:	0.000	Not Used
L:	0.000	Ratio Count
M:	0.000	Not Used
N:	0.000	Not Used
O:	0.000	Not Used
P:	0.000	Not Used
Q:	0.000	Not Used
R:	0.000	Not Used
S:	173.000	Elapsed Time in Session
T:	1055.000	Elapsed Time in 0.01 second Increments for SoftCR Data
U:	0.000	Not Used
V:	0.000	Reward Count Between Ratio Changes
W:	0.000	Not Used
Y:	0.000	Not Used
Z:	0.000	Subscript for List X

The "L" variable holds current number of presses from the correct lever, which gets compared to the ratio value. If ratio value has been met, L gets reset to 0. "V" holds the value for how many times current ratio has been rewarded and is also reset to "0" when ratio is incremented.

Breakdown of Sample File - Arrays

The arrays are presented in rows of 5 elements each. The first row begins with element 0 and ends with element 4; the second row begins with element 5 and ends with element 9, etc. Each row begins with an element marker followed by a colon, 0:, 5:, 10:, 15:, 20:, 25:, 30:, etc. Size of Array C was set to 10000 with the DIM command, which means that Array C was defined for 10001 data points. Under MED-PC Version IV, this array may be enlarged up to 1 million elements; however, 10,000 was felt to be adequate for this application. An end of array seal -987.987 will limit the saved file to only those elements used during the running of the procedure.

Each array has been defined in the comments section at the beginning of the .mpc file. That information was used to add the following labels to each array. The lines were expanded to make room for the labels. See MPC2XL for producing labeled data files with all or just some of the information below.

Array A - Raw Data

Array A contains the control variable values. The values are preset to default values in State Set 1, State 1. They are displayed as named variables and can be changed by any of the methods described previously. Once a session is started these values should not be changed to insure the integrity of the experiment.

```
A:
    0:      1.000      1.000      5.000      0.000      60.000
    5:      1.000      3.000      1.000      1.000      1.000
```

Array A with Labels

	A(0)	A(1)	A(2)	A(3)	A(4)
Row Marker	Correct Lever	Reward	Reward Time	Time Out	Session Time
0:	1	1	5	0	60
	A(5)	A(6)	A(7)	A(8)	A(9)
Row Marker	Type of PR	Starting PR	Step Value	Step Frequency	SoftCR Data Array
5:	1	1	1	1	1

Array B - Raw Data

Array B is used for the working variables that may change as the session runs. Elements for Correct Responses, Incorrect Response and Total Responses will be incremented according to animal's responses as session runs.

B:

0: 8.000 3.000 5.000

Array B with Labels

Row	B(0)	B(1)	B(2)
Marker	Total Responses	Correct Responses	Incorrect Responses
0:	8	3	5

Array C – SoftCR Pro Data

Array C contains summary information for SoftCR Pro. The value of every variable conforms to the Data Element Format described in the SoftCR Pro chapter of this manual.

C:

0: 0.500 85.600 0.500 12.600 0.500
 5: 77.600 0.500 18.600 0.500 53.600
 10: 0.500 161.100 0.200 140.100 135.100
 15: 0.200

Array C with Labels

	C(0)	C(1)	C(2)	C(3)	C(4)
Row	SoftCr is	Response	Set Pen Down	Response	Set Pen Down
Marker	Activated	Incorrect		Incorrect	
0:	0.500	86.100	0.500	12.600	0.500
	C(5)	C(6)	C(7)	C(8)	C(9)
Row	Response	Set Pen Down	Response	Set Pen Down	Response
Marker	Incorrect		Incorrect		Incorrect
5:	77.600	0.500	18.600	0.500	53.600
	C(10)	C(11)	C(12)	C(13)	C(14)
Row	Set Pen Down	Response Correct	Reinforcement	Response Correct	Response Correct
Marker					
10:	0.500	161.100	0.200	140.100	135.100
	C(10)				
Row	Reinforcement				
Marker					
15:	0.200				

Array X – array with assigned values

Sample file contains X array with assigned values. This array is declared with LIST command on line 83 of Progressive Ratio.mpc file. Every sample file will contain this array with the same values.

CHAPTER 5

SoftCR Pro

Each Operant Conditioning Laboratory procedure stores IRT data in array C that may be used by the SoftCR Pro Cumulative Recorder program to generate a graphical record on screen or to print a Cumulative Record after the data has been collected. Each element in this "Cumulative Record" data array consists of two components. The integer value or value to the left of the decimal point is the time component. The decimal value or value to the right of the decimal point is a SoftCR Pro code component.

Time Components

Time components may be Relative or Absolute. In a Relative file, the time component of a given data element is equal to the elapse time since the previous element. In an Absolute file, it is equal to the elapse time since the beginning of the Record. The elements used in Progressive Ratio are all Relative with a resolution of 0.01 seconds (10 milliseconds). For example, if array C contained just two elements 350.1 and 330.1, the record would consist of one Response Step at 3.5 seconds ($350 * 0.01$) and a second Response Step 3.3 seconds later at 6.8 seconds on the X-Axis.

Control Code Components

The control code component indicates whether the element is a Response Step, Reinforcement Pip, Pen Reset, Event Pen Up, or Event Pen Down element. Up to 10 Event Pens (0 - 9) and 10 Trace Pens (0 - 9) may be specified in MED-PC. In addition, Resets may be made with the Pen "Up" (no vertical tracing) or "Down." Additional coded information may be possible in the future.

Data Element Format

Each data element must conform to the following format:

nnnnn.xyz

Where:

nnnnn = Time Component

xyz = Control Code Component

x = Datum Type

y = Datum Index

z = Don't Care Digit

NOTE: If there are more than three numbers past the decimal point, then the array will be considered invalid and will be ignored by SoftCR Pro.

Allowed datum types and indices are:

nnnnn.1yz = Response or Step

y = Index (0 - 9) for Multi-Trace Files

"NULL" for Single Trace Files

nnnnn.2yz = Reinforcement or Pip

y = Index (0 - 9) for Multi-Trace Files

"NULL" for Single Trace Files

nnnnn.3yz = Unused

nnnnn.4yz = Unused

nnnnn.5yz = Set Event Pen To Level 0 ("Down" or at baseline), where

y = Event Pen Number (0 - 9)

nnnnn.6yz = Unused

nnnnn.7yz = Unused

nnnnn.8yz = Unused

nnnnn.9yz = Unused

Data in the array being plotted that does not conform to the above rules will be ignored.

Example of SoftCR Pro

Figure 5.1 is an example of what a Progressive Ratio schedule will look like in SoftCR Pro after an experiment is run. The red line records a Step for every correct response that is made. A reward is recorded as a Pip, or a hash mark on the red line. The black lines at the bottom of the screen are called Event Pens and can be used in a variety of ways for a number of purposes. The black line can go up and down, creating quick Spikes like the ones seen here, or long plateaus that represent certain periods of time during an experiment. Here, the Event Pen 0 records a Spike for every incorrect response that is made. Event Pen 1 records plateaus for Time-Out times, if applicable.

Figure 5.1 - Example of a Progressive Ratio Schedule Shown in SoftCR Pro

